Coping with Indoor Wildfire Smoke

Lessons from the Colville Reservation

NATIONAL WILDFIRE COORDINATING GROUP SMOKE COMMITTEE WEBINAR FEBRUARY 23, 2017

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Confederated Tribes of the Colville Reservation

1.4 Million Acres

12 Tribes

7,587 residents

3.5 people per square mile

Major employers - Tribal, County, State and Federal governments

Lands in both

fee (20%)

trust (80%)



Fire Chronology

June 12 – 16,000 acres had burned in South Eastern Washington State

June 26 – Governor declare state of emergency because of predicted conditions

June 28 - Sleepy Hollow Fire, Wenatchee, 2,950 acres, 29 homes and 2 commercial building

August 13 – North Star Fire, Colville Reservation, 218,138 acres,

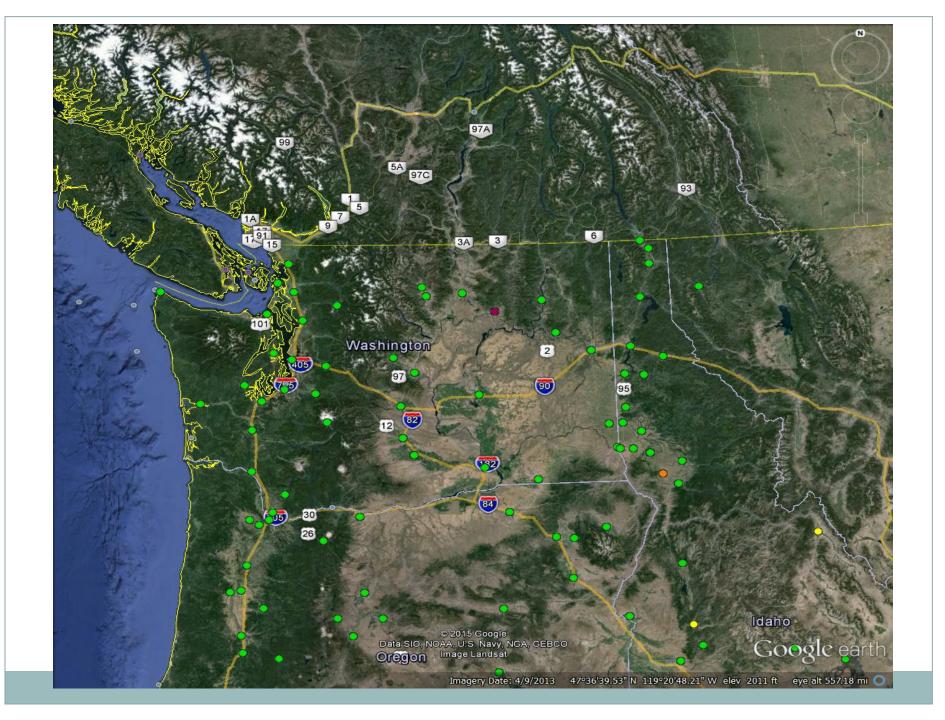
August 14 – 5 fires form the Chelan Complex, 89,000 aces, 3,000 evacuated, 85 homes and several businesses burned

August 19 – Twisp River Fire Explodes, 11.200 acres, 3 firefighters perish

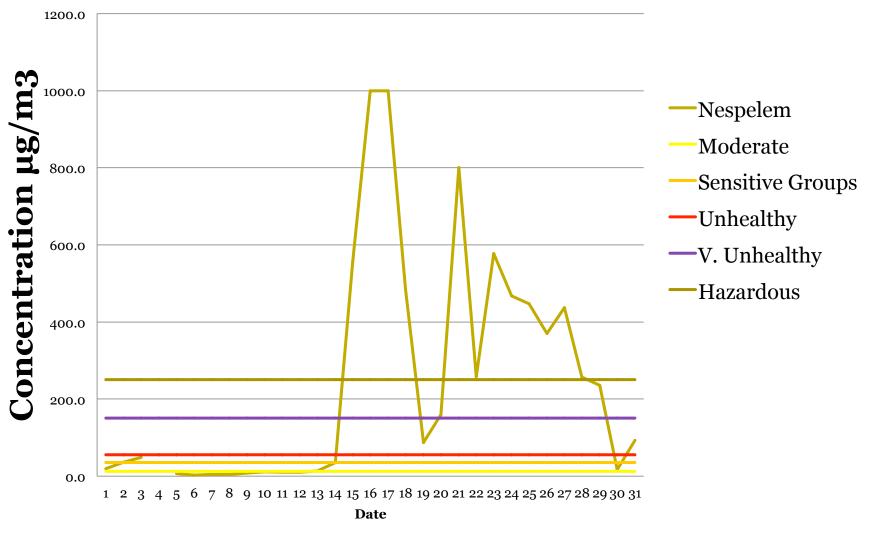
August 20 – 5 fires form the Okanogan Complex, Okanogan County and Colville Reservation, 304,782 acres, 45 homes, 49 cabins and 60 outbuildings burned

August 21 – President Barack Obama declares federal state of emergency

August 23 – 4.3 magnitude earthquake in North Star Fire



August 2015 Nespelem Monitor 24 hour Average Concentration



Monitors Reach Maximum Readings





Met One Aerocet 831

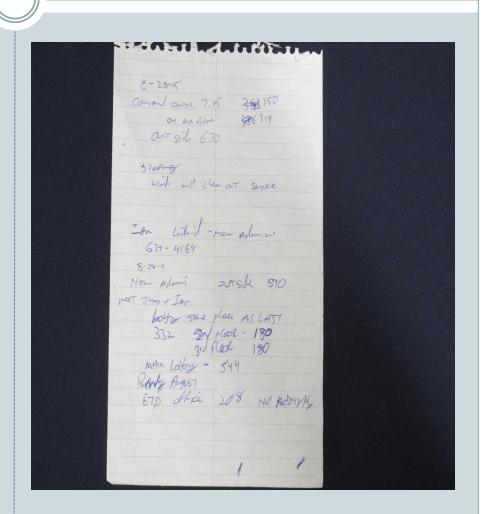
Light Scattering

- Displays PM 1, PM 2.5, PM4 and PM 10
- Concentration range 0 to 1,000 μg/m3
- Sample period fixed at 1 minute or continuous
- Location by number designation
- Stores 2,500 data points



My Sampling Plan

- Walk into building and sample several rooms
- Write down concentrations levels
- Walk out and continue to next building



What Was Discovered

Measurements From th	e Morning of	August 25, 2015
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My Office 405 μg/m3 Hazardous

Reservation Attorney 394 Hazardous

Head Start 633 Hazardous

Admin Building 798 Hazardous

Archeology Office 630 Hazardous

Prosecutors Office 278 Hazardous

IHS Clinic Lobby 166 Very Unhealthy

Outside Concentration 980 Hazardous

More Bad News

Morning of August 26

My Office $151 \mu g/m_3$ Very Unhealthy

BIA Building Lobby 668 Hazardous

Child Care Front Desk 599 Hazardous

Emergency Command 1415

Food Distribution 1403

Head Start 1125

Outside **880 to 2175**

Health Concerns

- Shortness of Breath
 - High PM values
 - o CO, CO2 and Ozone levels undocumented
- Dehydration
 - High temperatures 100 Degrees F and above
- Reluctance to Wear Masks
 - Harder to breathe through
 - If they have respiratory problems need to have doctor approval
- Administrative Leave

People Were Nervous

- Evacuation
 - Leaving
 - Preparing to leave
 - Just left in time
- Long term smoke becomes chronic for healthy people
- Smoke where it should not be, in our houses

Using N95 Masks

Masks for Smoky Conditions

Masks Come in Different Sizes and Shapes







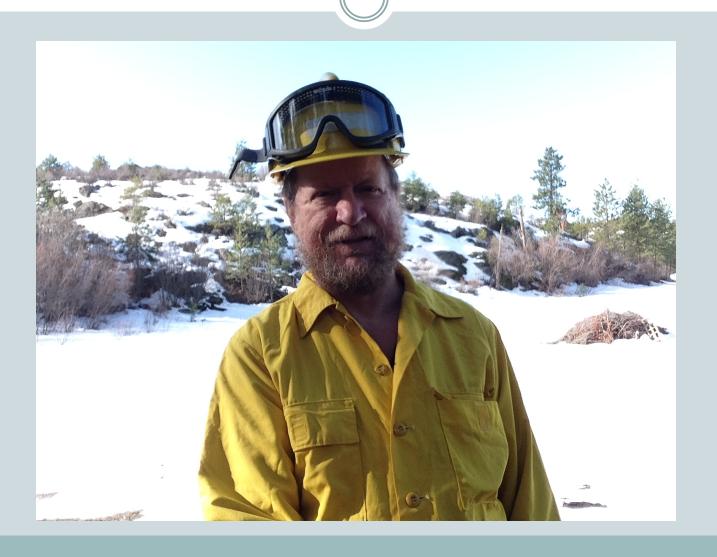
Managing Buildings for Cleaner Air

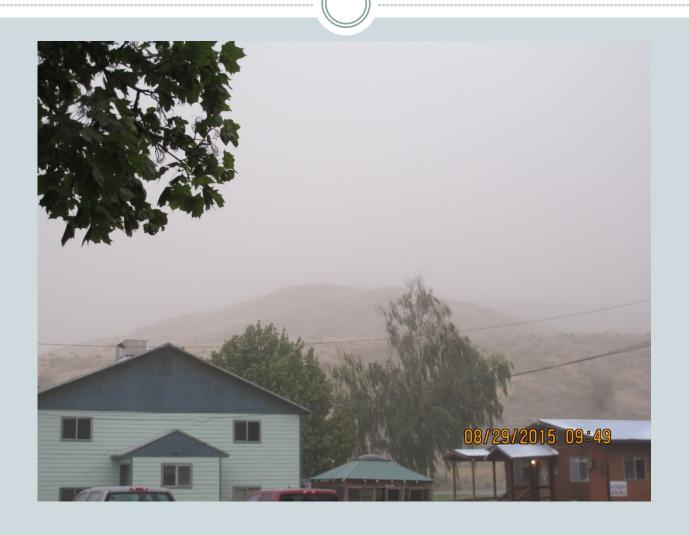
- Limit door use and location
- Air Conditioning system
 - Filters
 - Shut off
 - Time of day
- Wear N95 masks indoors
- Portable air cleaners
 - Ozone Generation ionization settings
- Air Scrubbers
- Create positive air pressure





Prepare Early for Next Wildfire Season





Simple Data Form

Facility Report Form						
Outdoor Concentrations						
Time						
Date	PM 2.5 μg/m3	CO ppm	CO ₂ ppm	Notes		
Room						

Health Concern Guidance

Air Quality Index (AQI) Values	Levels of Health Concern	AQI PM2.5 (μg/m3) 24 -Hour Average	Levels of Health Concern
0 to 50	Good	0.0-12	Air quality is considered satisfactory and air pollution poses little or no risk.
51 to 100	Moderate	12.1-35.4	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
101 to 150	Unhealthy for Sensitive Groups	35.5-55.4	Members of sensitive group may experience health effects. The general public is not likely to be affected.
151 to 200	Unhealthy	55.5-150.4	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
201 to 300	Very Unhealthy	150.5-250.4	Health warnings of emergency conditions. The entire population is more likely to be affected.
301 to 500	Hazardous	250.5+	Health alert: everyone may experience more serious health effects.

Sampling Tool Box

- Met One Aerocet 831
- Amprobe CO2 Meter
- Amprobe CO Meter
- Clipboard, sampling sheet, education material
- Cell phone word gets around



Air Resource Advisor Factsheet

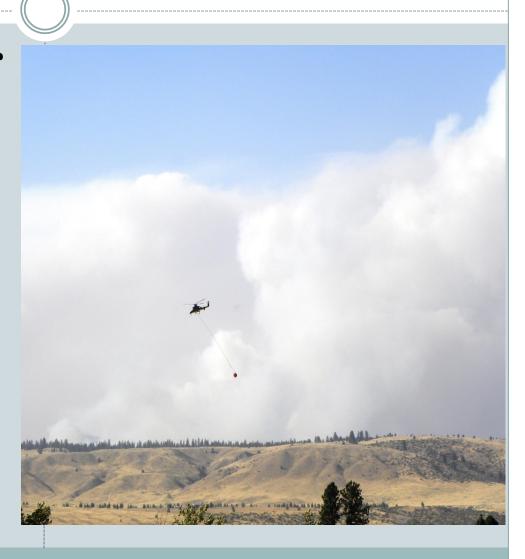
Air Quality and Meteorological Sites Guide

- Local Contacts
- Description of the Reservation
- Regulation Governing AQ
- Air Quality Monitoring Site
- Where to Find the Data
- Map of Communities in the Area

EPA Delegation of Sections of the Federal Air Rules for Reservations

General Rule for Air Pollution Episodes

- Air Stagnation Advisory
- Air Pollution Alerts
- Air Pollution Warning
- Air Pollution Emergency



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